

Transforming OSS/BSS with Microservices for Increased Agility: Key Actions for Telecom Operators

Abstract

The telecom industry stands at a critical juncture today. Traditional offerings, which until a few years ago accounted for a major portion of its revenues, are increasingly getting commoditized. Amid intense competition from over-the-top (OTT) service providers, average revenue per user (ARPU) and profit margins continue to decline for communication service providers (CSPs) worldwide. To add to the industry's challenges, customer expectations around on-demand, flexible services, and enhanced personalization of offerings, keep evolving at an unprecedented pace.

To ensure sustained relevance in a fast-changing business landscape, CSPs are looking to transform into innovative digital service providers, unlock new revenue streams. This paper outlines the important internal measures that CSPs need to undertake, with regard to upgrading their core IT architectures, to be future-ready. We explore the microservices variant of service-oriented architecture (SOA) that helps systems become sleeker, flexible, and more agile.

IT Spend Optimization Won't Suffice

The pace at which the telecom industry is developing next-generation offerings such as 5G network, IoT systems, and virtual reality solutions highlights its growing efforts to reposition itself through digital transformation. For these ambitious initiatives to yield the desired business results, CSPs must first redo their IT landscapes.

As service complexities increase and technological changes necessitate new investments, telecom companies will have to spend big on IT in order to provision services as well as run seamless operations. is expected to rise going forward,. At the same time, the need for service agility is now more than ever, for telcos to be able to reduce customer churn and maximize customer lifetime value (CLV). Therefore, CSPs have to strike a delicate balance between cost reduction and infrastructure improvements that will fuel revenue growth.

Recognizing this imperative, many CSPs have initiated an overhaul of their business IT systems to rationalize infrastructure spend while adding new service functionalities. However, for CSPs to really crack the digital transformation code, merely optimizing spend would not be enough. They must completely revamp their traditional business processes and IT models to reduce the time-to-market, and deliver a distinctly superior and differentiated customer experience.

Moving from Transactional to Automated OSS/BSS

Today, the business applications of most telecom companies are characterized by complex, rigid legacy systems that are well past their sell-by dates. Apart from entailing an onerously high total cost of ownership (TCO), these systems offer limited scalability and flexibility for addition of new features, thus adversely affecting customer service. Any upgrades most often require compliance with elaborate procedures that directly impact business agility, and subsequently, customer satisfaction. This undermines any initiatives the CSPs may have rolled out to enhance customer experience, as the core functionalities largely remain unchanged.

Telecom operators, therefore, should initiate an overhaul of their IT architectures to make their operational support systems (OSS) and business support systems (BSS) truly flexible, agile, and responsive to fast-changing customer

requirements. Existing OSS and BSS, which are primarily transactional in nature, need to be made automated and event-driven. For instance, front-end and back-end workflows built around manual logging of customer service requests should be automated, enabling instant provisioning and self-service options. Such a transition, if successful, will make OSS and BSS capable of effectively self-managing the entire service lifecycle, thereby reducing both TCO and customer attrition.

Microservices: Build Easy, Build Faster

The key test of an OSS/BSS transformation exercise will be its ability, or the lack thereof, to provision the various IT functionalities in a flexible, open, and standardized manner. In order to ensure this, CSPs should adopt the microservices software architecture. The architecture is based on the principle of breaking down large, complex IT systems into multiple easily manageable and autonomous constituents, each of which addresses a particular business requirement.

Microservices are essentially small, flexible, and completely self-contained software modules that can perform a specific operation independently.

Another advantage of embracing this framework is that, unlike from-scratch software implementations, microservices do not require recoding of existing applications for feature enhancements. Incorporating a new functionality is as simple as adding one more independent component or module that fits neatly with existing dimensions.

This simpler approach to delivering new services, and optimizing existing ones, paves the way for rapid, frictionless, and cost-effective IT upgrade and maintenance. Moreover, microservices, which typically are built using Agile and DevOps methodologies, can help CSPs scale their OSS/BSS implementations in line with dynamic business requirements.

For many CSPs, however, transitioning to the world of microservices remains a challenge, largely due to two reasons. Developing applications as collections of loosely coupled, autonomous services requires a software development approach that is fundamentally different from conventional ones used to build large monolithic applications. Therefore, this requires a completely different skill set. Secondly, the prevalent culture at many telecom IT organizations may not be open to wide-scale innovations in their basic architecture principles, preferring instead the status quo of existing software frameworks the company is familiar with.

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Proposed Roadmap for Microservices Rollout

For CSPs looking to boost agility through OSS/BSS transformation, we propose the following four-step roadmap for the adoption of microservices:

- **Break up applications by domain:** Existing OSS/BSS applications are mostly fragmented, built and maintained in silos, and involving heterogeneous technologies. They also use various disparate product and service catalogues that adversely impact automation and service provisioning. As a first step, CSPs must identify and segregate all applications under the relevant functional domains, and then break down the underlying functionalities into the requisite services.
- **Identify the microservices; develop services catalog:** Based on the consumption patterns of other upstream systems, identify a standard set of services for each business entity. Besides defining the services for basic CRUD transactions, classify additional services to support UI features, such as dashboards for applications, 360-degree customer profiling, and service agents. After listing all mandatory and optional services, organizations should identify the corresponding microservices to be deployed, depending on the volume of data handled and operational requirements. Make sure each microservice delivers the requisite functionality in a consistent and reusable manner, and becomes the master of a specific data domain.
- **Build the UI and processes that will consume microservices:** Implement standard application programming interfaces (APIs), typically REST APIs, to facilitate interaction between various microservices. Execute business processes through a 'choreography model' that lets the microservices manage different interactions directly. Enable the communication layer through a simple 'message bus' built around 'smart end points and dumb pipes' which are lighter and simpler than the Enterprise Service Bus.
- **Finalize implementation architecture:** Out of the multiple microservices implementation approaches available, one of the possible options could be using the open source Netflix OSS stack methodology. Under this approach, you first develop the core microservices using the popular Spring Boot, whose wide-ranging features foster rapid development of individual components. You can also use out-of-the-box dependencies such as Eureka and Zuul to augment the Netflix stack. Adopting this implementation methodology will

also help you leverage JPA support for RDMBS, enable REST services, ensure service façade using Feign Client, and use the Spring Actuator for monitoring the services. Alternatively, you may consider other options such as the Amalgam8 or Apache Zookeeper.

Driving Agility with Microservices

As CSPs seek to transform business and operating models, agility will play a vital role in enabling superior customer experience. Transitioning to microservices can help realize this goal, and adapt effectively to a rapidly changing business environment. Organizations will also realize significant financial savings, and boost operational efficiency, by avoiding unnecessary efforts and time that would otherwise have been spent on new code development, end-to-end testing, and service disruption management.

For CSPs looking to build superior service agility, considering microservices as part of their integral IT architecture is no more just a choice. It is the pressing need of the hour that can empower them to become truly responsive to their customers.

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